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Interactive comment on "Ice nucleators have shorter persistence in the atmosphere than other airborne bacteria" *by* Emiliano Stopelli et al.

Anonymous Referee #2

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General comments

This study represents the results of INP measurements and bacteria cell counting of 56 snow samples collected at Jungfraujoch over an 18-month sampling period. They found a larger dynamic range of INP active at -8°C compared to the number of bacterial cells and a high fraction of living bacteria cells. Correlations with water vapor loss prior sampling show that INP have shorter atmospheric residence times than bacterial cells, in particular at low wind speeds. Furthermore, 24 strains of Pseudomonas syringae were isolated from selected samples and phylogenetically characterized.

The manuscript is well written and the results are clear and well presented.

Specific comments

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Discussion paper

1. I suggest renaming the section 3 from “results” to “results and discussion” as there is no separate discussion section.

2. When discussing the higher concentration dynamics of the INP compared to bacteria the authors mention changing source and sink strength of INP and bring a one short statement about “other particles carrying a biological INP” on P4 Line20. This discussion seems very general and should be extended. Other possible biological INP sources (at least fungi) should be specifically mentioned and more references should be cited. This would also help to explain the INP-8 concentrations at JFJ as P. syringae was found only in three out of 13 tested samples. Given the high diversity of P. syringae strains as found in those samples and an average of 60% of total living bacteria cells in the samples one could actually expect to find P. syringae in more samples. Preferential removal of P. syringae with precipitation and loss of culturability during atmospheric transport as stated in the MS seems possible, but possible sources of non-P. syringae INP active at -8°C should be discussed in more detail.

3. Some more information about the sampling conditions would be helpful as the station at JFJ is not always within clouds. Did the authors only collect precipitation/snow when the station was within clouds? And if not, did they found differences in the number of INP and bacterial cells in samples collected in a cloud compared to samples collected below a cloud? Why was there no sampling in winter?

Other comments/typos:

P2 Line 23: Although the math is correct here, I think it is better to consistently use either 0.9 % (as on P3 Line 18) or 9 ‰ NaCl.

P2 Line 23: Please provide some basic information here. How many droplets did you measure? What was the volume of the droplets? What kind of controls were measured?

Table 1 caption: I suggest to change the beginning to “Diversity of Pseudomonas sy-

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ringae strains. . .”

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